

VIII. GLOSSARY

Affected Environment: The environment of the area to be affected or created by the alternatives under consideration. (40 CFR 1502.15). Surface or subsurface resources (including social and economic elements) within or adjacent to a geographic area that could potentially be affected by steep slope surface mining and valley fill activities. Any land or water surface area that is used to facilitate, or is physically altered by, surface coal mining and reclamation operations.

Agricultural Land Use: Any land that is used primarily for the production of crops. As used here, this land use classification also includes, but is not limited to, grazing lands, pastures, woodlands, and forests interspersed within croplands.

Aerial Photogrammetric Mapping: Contour maps developed from stereo pairs of air photographs.

Alternative: A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision-making. An alternative need, not substitute, for another in all respects.

Alternative, No-Action: An alternative that maintains established trends or management direction.

Annual Plants: Plants living for only one growing season and then seeding to form the next generation.

Anthracite Coal: A hard, black lustrous coal containing a high percentage of fixed carbon and a low percentage of volatile matter. Commonly referred to as hard coal, it is mined in the United States, mainly in eastern Pennsylvania, although in small quantities in other states.

Anticline: A fold that is convex upward or had such an attitude at some stage of development. In simple anticlines the beds are oppositely inclined, whereas in more complex types the limbs may dip in the same direction. Some anticlines are of such complicated form that no simple definition can be given. Anticlines may also be defined as folds with older rocks toward the center of curvature, providing the structural history has not been unusually complex.

Approximate Original Contour (AOC): The surface configuration achieved by backfilling and grading of the mined area so that the reclaimed area, including any terracing or access roads, closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all highwalls and spoil piles eliminated. All mined areas are to be returned to AOC, unless they receive a variance from it [Subsection 701(2) of SMCRA].

Approximate Original Contour (AOC) Variance: A regulatory authority may grant a variance or waiver from the requirement to restore a site to AOC if certain specified conditions are satisfied.

Area Mining: A mining operation where, unless the operation is located in a steep-slope area and a steep-slope AOC variance has been granted, all disturbed areas are restored to (1) AOC and (2) the site is capable of supporting the uses that existed prior to mining or an equal or better use.

VIII. Glossary

An area-mining operation may remove multiple seams of coal in the upper reaches of a mountain just like a mountaintop-removal operation; however, this type of operation cannot be classified as a mountaintop-removal operation for two reasons. First, the site may be restored to AOC; second, the entire coal seam or seams may not be removed.

Aquifer: (a) A layer of geologic material that contains water. (b) A zone, stratum, or group of strata that can store and transmit water in sufficient quantities for a specific use.

Augering: A method of mining coal at a cliff or highwall by drilling holes into an exposed coal seam from the highwall and transporting the coal along an auger bit to the surface.

Backfill: The operation of refilling an excavation. Also, the material placed in an excavation in the process of backfilling.

Bank Cubic Yards: The volume of overburden material in the ground before it has been excavated and expanded by swell.

Belt Conveyor: a) A moving endless belt that rides on rollers and on which materials can be carried. The principal parts of a belt conveyor are (1) a belt to carry the load and transmit the pull, (2) a driving unit, (3) a supporting structure and idler rollers between the terminal drums, and (4) accessories, which include devices for maintaining belt tension and loading and unloading the belt, and equipment for cleaning and protecting the belt.

Bench: Specific to surface mining, this refers to the floor(s) of mining excavation areas where backfilling will occur.

Benthic: Relating to or occurring at the bottom of a body of water.

Biological Diversity: The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area.

Bituminous Coal: (1) Coal that ranks between subbituminous coal and anthracite and that contains more than 14 percent volatile matter (on a dry, ash-free basis) and has a calorific value of more than 11,500 Btu/lb (26.7 MJ/kg) (moist, mineral-matter-free) or more than 10,500 Btu/lb (24.4 MJ/kg) if agglomerating (ASTM). It is dark brown to black in color and burns with a smoky flame. Bituminous coal is the most abundant rank of coal; much is Carboniferous in age.

Syn: soft coal. (2) A coal that is high in carbonaceous matter, having between 15 percent and 50 percent volatile matter. Soft coal. (3) A general term descriptive of coal other than anthracite and low-volatile coal on the one hand and lignite on the other. (4) A coal with a relatively high proportion of gaseous constituents; dark brown to black in color and burns with a smoky luminous flame. The coke yield ranges from 50 percent to 90 percent. The term does not imply that bitumen or mineral pitch is present.

Blanket Drain: Porous zone of large rock formed beneath a valley fill by rolling segregation during wing dumping.

VIII. Glossary

Box Cut: A mining cut excavated into the slope of a hillside, resulting in highwalls on three sides of the cut, or through a mountaintop or ridge crest, resulting in highwalls on two sides of the cut. This type of cut is used to initially open a hillside or mountaintop or ridge crest to all initiation of spoil casting by equipment or explosives.

BTU: British Thermal Unit - a measure of the heat content; the heat required to raise the temperature of one pound of water by one degree (F).

Buffer Zone: An area between two different land uses that is intended to resist, absorb, or otherwise preclude developments or intrusions between the two use areas.

Bulking Factor: The net expansion of overburden material resulting from excavation and subsequent backfilling, usually referred to in the mining industry as the swell factor.

Cage: Elevator car used for carrying personnel in an underground mine shaft hoist.

Cast Blasting: A mining method whereby the force of blasting explosions used to fragment overburden is directed to cast the resulting spoil horizontally into an adjacent open area or mine cut.

Center Ditch: Rock-lined ditch used to carry runoff from the surface of a valley fill down its face to its toe.

CHIA: A CHIA is a cumulative hydrologic impact assessment. Before a SMCRA permit can be approved, an assessment of the cumulative hydrologic impacts of all anticipated mining on the hydrologic balance in the cumulative impact area is performed. Before a SMCRA permit can be approved, the CHIA must find that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. CHIA preparation is an integrated process which embodies a specific application of hydrologic information management at each step of the process. The scope of a CHIA may initially include all components of the groundwater and surface water systems in the cumulative impact area. This initial scope can be systematically and logically reduced to those concerns of quantity and quality considered significant to maintaining the hydrologic balance of the area. The process focuses on those aspects of the hydrologic balance that are likely to affect designated uses of water. A sample outline is available at the Office of Surface Mining website <http://www.osmre.gov//chiaint.htm>

Clearing and Grubbing: The process of removing vegetation and large stumps and roots from a site in preparation for topsoil stripping or other excavation.

Coal seam: A layer, vein, or deposit of coal.

Combined Uses Land Use: Any appropriate combination of land uses where one land use is designated as the primary land use and one or more other land uses are designated as secondary land uses.

Commercial Woodland: Land where forest cover is managed for commercial production of timber products.

VIII. Glossary

Continuous Miner: A self-propelled mining machine for excavating coal within underground mines or from beneath surface mine highwalls, usually accompanied by a conveyor to carry the coal to a loading point.

Contour Mining: Surface mining that progresses in a narrow zone following the outcrop of a coal seam in mountainous terrain, and the overburden, removed to gain access to the mineral commodity, is immediately placed in the previously mined area, such that reclamation is carried out contemporaneously with extraction.

Core Drain: Central column of porous large rocks in a valley fill formed by rolling segregation and convergence of materials at the valley fill center during wing dumping.

Council on Environmental Quality (CEQ): An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effort on the environment, conducts environmental studies, and advises the President on environmental matters.

Cropland Land Use: Land used for the production of adapted crops for harvest, alone or in rotation with grasses and legumes, that include row crops, small grain crops, hay crops, nursery crops, orchard crops, and other similar crops.

Crosscut: Tunnel used to connect two entries in an underground mine.

Cultural Landscape: A cultural landscape is a geographic area, including both cultural and natural resources and the wildlife and domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. There are four general types of cultural landscapes, not mutually exclusive: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

Cultural Resources: (1) In the aims of historic preservation, all of the physical manifestations of archeology and history are cultural resources. (2) Cultural resources includes archeological sites, structures and objects significant to American history and prehistory. May include battlefields, ships, places where treaties were signed, places of significant events. (3) They are important for their representation of cultures, lifestyles, people, architecture, engineering, arts and events, or for the information they contain, or for associations they have with past people or events. (4) Cultural resources are considered fragile and non renewable resources, once they are removed, lost or destroyed, they are gone forever.

Cumulative Impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)

Cut: An excavation, generally applied to surface mining; to make an incision in a block of coal; in underground mining, that part of the face of coal that has been undercut.

Daylighting: Excavation of underground mine voids so that they can be backfilled.

VIII. Glossary

dBA: Is the symbol for a sound level measured on an A-weighted scale. The A-weighted scale gives more weight to those frequencies that are audible to the human ear (about 500 Hz to about 8000 Hz) and discounts those frequencies outside the band of frequencies audible by the human ear.

Dendritic: The dendritic drainage pattern is characterized by irregular branching in all directions with the tributaries joining the main stream at all angles. Resembling the vein patterns in a tree leaf.

Development Areas: Areas mined or otherwise excavated in advance of production mining to establish highwalls and drilling benches for production areas.

Development Equipment: Medium to light equipment used for excavation and haulage in development areas, usually hydraulic excavators, loaders, dozers, and haul trucks.

Dip: Inclination in degrees of a planar geologic stratum from the horizontal.

Disturbed Area: An area where vegetation, topsoil, or overburden is removed or upon which topsoil, spoil, coal processing waste, underground development waste, or noncoal waste is placed by surface coal mining operations. Those areas are classified as disturbed until reclamation is complete and the performance bond or other assurance of performance is released.

Dozer: Generic term used for bulldozers, also referred to as tractors; tract-mounted earthmoving equipment with a forward blade for pushing material.

Dragline: A type of excavating equipment that casts a rope-hung bucket a considerable distance; collects the dug material by pulling the bucket toward itself on the ground with a second rope; elevates the bucket; and dumps the material on a spoil bank, in a hopper, or on a pile.

Dump Equipment: One of many conveyances that carry and then dump rock, coal or ore. Generally trucks in surface mining and shuttle cars in underground mining.

Durable Rock: Naturally formed aggregates that will not slake in water or degrade to soil material. Federal law provide that durable-rock fills must consist of at least 80 percent durable rock [30 CFR §§ 816.73 and 817.73].

Effects: Effects include direct effects and indirect effects. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Effect and impacts as used in these regulations are synonymous. Effects includes ecological such as the effects on natural resources and on the components, structures and functioning of affected ecosystems, aesthetic, historic, cultural, economic, social or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if in balance the agency believes that the effect will be beneficial.(40 CFR 1508.8)

VIII. Glossary

Elevation: A general term for a topographic feature of any size that rises above the adjacent land or the surrounding ocean bottom; a place or station that is elevated. The vertical distance from a datum (usually mean sea level) to a point or object on the Earth's surface; esp. the height of a ground point above the level of the sea. The term is used synonymously with altitude in referring to distance above sea level, but in modern surveying practice the term elevation is preferred to indicate heights on the Earth's surface, whereas altitude is used to indicate the heights of points in space above the Earth's surface.

Endangered Species: Federally listed: any species of animal or plant in danger of extinction throughout all or a significant portion of its range; state (group I): species whose prospect of survival or recruitment in the state are in jeopardy in the foreseeable future; state (group II): species whose prospect of survival or recruitment within the state may become jeopardized in the near future.

Endemic: Any localized process or pattern, but usually applied to a highly localized or restrictive geographic distribution of a species.

Environmental Assessment (EA): A concise public document prepared to provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact. An EA includes a brief discussion of the need for a proposal, the alternatives considered, the environmental impacts of the proposed action and alternatives, and a list of agencies and individuals consulted.

Environmental Impact Statement (EIS): A document prepared to analyze the impacts on the environment of a proposed project or action and released to the public for comment and review. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed project or action.

Excess Spoil: (1) Spoil in excess of that necessary to backfill and grade affected areas to the approximate original contour. The term may include box-cut spoil where it has been demonstrated for the duration of the mining operation, that the box-cut spoil is not needed to restore the approximate original contour. (2) Overburden material that is disposed of in a location other than the mine pit. [30 CFR § 701.5]

Exotic: Those species that occupy habitats of which they did not evolve and often have no natural enemies to limit their reproduction and spread--frequently at the expense of native plants and animals and, sometimes, of entire ecosystems. The words exotic, invasive, and non-indigenous are often used synonymously.

Face: The working surface of a coal seam where it is being excavated, usually applied to underground mining. Also the front of the downstream end of a valley fill.

Factor of Safety: Engineering term used to evaluate slope stability in valley fills with regards to rotational sliding and failure; greater values for a factor of safety indicate greater slope stability.

Fills: Fill structures that are created by the placement of excess spoil in valleys, on hill sides, or on preexisting benches. Although most excess-spoil fills are commonly referred to as valley fills, most

VIII. Glossary

mountaintop-removal and steep-slope mining operations today involve the construction of durable-rock fills [OSM-30 CFR §§ 816.71 and 817.71].

Fines: Very fine-grained coal materials or dust typically generated as residue from coal processing facilities.

Fish and Wildlife Habitat and Recreation Lands: Wetlands, fish-and-wildlife habitat, and/or areas managed primarily for fish and wildlife and recreation.

Flume: see Core Drain.

Forb: Any herbaceous plant that is not a grass or grass-like in nature; leafy soft-stemmed plants.

Forestland: (1) Land with at least 25 percent tree canopy or that has been stocked with at least 10 percent forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially reforested. (2) Land bearing a stand of trees of any stature, including seedlings, and of species attaining a minimum of 6 feet average height at maturity or land from which such a stand has been removed but on which no other use has been substituted. The term is commonly limited to land not in farms; forests on farms are commonly called woodland or farm forests.

Fragipan: A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Front End Loader: A rubber-tired piece of earthmoving equipment with a single forward-facing bucket mounted on hydraulic lifting arms, usually abbreviated to “loader.”

Fugitive Dust: The particulate matter not emitted from a duct or stack that becomes airborne due to the forces of wind or surface coal mining and reclamation operations or both. During surface coal mining and reclamation operations it may include emissions from haul roads; wind erosion of exposed surfaces, storage piles, and spoil piles; reclamation operations; and other activities in which material is either removed, stored, transported, or redistributed.

Glaciated: 1. Said of a country which has been scoured and worn down by glacial action, or strewn with ice-laid drift. 2. Covered by and subjected to the action of a glacier.

Glaciation: Alteration of the Earth’s solid surface through erosion and deposition by glacier ice.

Graders: Rubber-tired earthwork equipment with a center-mounted, underslung blade used for fine grading of roads or reclamation surfaces.

Grazing Land Use: As used here, open woodland and desert shrubland that is predominantly used for grazing, browsing, or occasional hay production.

VIII. Glossary

Groin Ditch: Rock-lined ditch used to carry runoff from slopes surrounding a valley fill to the toe of the valley fill.

Groundwater: Subsurface water that fills available openings in rock or soil materials to the extent that they are considered water saturated.

Haul Distance: The distance from the coal face to pit bottom or surface; the distance quarry or opencast products must be moved to the treatment plant or construction site; the distance from the shaft or opencast pit to spoil dump.

Haul Road: (1) A road built to carry heavily loaded trucks at a good speed. The grade is limited on this type of road and usually kept to less than 17 percent of climb in direction of load movement. (2) Road from pit to loading dock, tippie, ramp, or preparation plant used for transporting mined material by truck.

Haul Truck: Any of a variety of wheeled trucks used for haulage of spoil or coal, usually having an open dump bed.

Hayland or Pasture: Land used primarily for the long-term production of adapted, domesticated forage plants to be grazed by livestock or cut and cured for livestock feed.

Head-of-Hollow Fill: A fill structure consisting of any materials, other than a coal processing waste or organic material, placed in the uppermost reaches of a hollow where side slopes of the existing hollow measured at the steepest point are greater than 20 degrees, or the average slope of the profile of the hollow from the toe of the fill to the top of the fill is greater than 10 degrees. In fills with less than 250,000 yd³ (191,000 m³) of material, associated with steep slope mining, the top surface of the fill will be at the elevation of the coal seam. In all other head-of-hollow fills, the top surface is the fill, that when completed, is at approx. the same elevation as the adjacent ridge line, and no significant area of natural drainage occurs above the fill draining into the fill areas.

Heading: Term for the entries used in a longwall mine to access coal panels.

Headwater: The source (or sources) and upper part of a stream, including the upper drainage basin.

Headwaters: Non-tidal rivers, streams, and their lakes and impoundments, including adjacent wetlands, that are part of a surface tributary system to an interstate or navigable water of the United States upstream of the point on the river or stream at which the average annual flow is less than five cubic feet per second. The District Engineer may estimate this point from available data by using the mean annual area precipitation, area drainage basin maps, and the average runoff coefficient, or by similar means. For streams that are dry for long periods of the year, District Engineers may establish the point where headwaters begin as that point on the stream where a flow of five cubic feet per second is equaled or exceeded 50 percent of the time. [COE-33 CFR 330.2(d)]

Herbaceous: Term for soft-stemmed grass and forb plant species.

Historic Property or Historic Resource: Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places.

VIII. Glossary

The term "eligible for inclusion in the national Register of Historic Places" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet the National Register listing criteria.

Highwall: The unexcavated face of exposed overburden and coal or ore in an opencast mine, or the face or bank on the uphill side of a contour strip mine excavation.

Highwall Limits: The maximum economical mining depth for a coal seam as established by its stripping ratio and market value.

Highwall Mining: Removal of coal from beneath a standing highwall without excavation of the overburden, using augers or continuous highwall mining machines.

Horizon: A stratigraphic zone containing a coal seam or other mineral deposit. The horizontal and/or vertical extent of a planar coal seam or mineral deposit.

Hydraulic Excavator: A piece of earthmoving equipment similar to a shovel, but using an articulated hydraulic arm for lifting rather than a fixed boom. Hydraulic excavators are divided into hoes, which dig with a forward-facing bucket, and backhoes, which dig with a back-facing bucket. Both types are mounted on tracks for mobility.

Hydrologic Balance: The relationship between the quality and quantity of water inflow to, water outflow from, and water storage in a hydrologic unit such as a drainage basin, aquifer, soil zone, lake, or reservoir. It encompasses the dynamic relationships among precipitation, runoff, evaporation, and changes in ground and surface water storage.

Hydrology: The science that relates to the water systems of the earth, or the principles of water flow, or the presence of surface or groundwater.

Hydroseeder: Usually a truck-mounted pump arrangement used for spraying a mixture of seed and stabilizing mulch in a fluid medium over a broad surface area for reclamation.

Industrial/Commercial Land Use: Land for: (a) extraction or transformation of materials for fabrication of products, wholesaling of products, or long-term storage of products. This includes all heavy and light manufacturing facilities. (b) Retail or trade of goods or services, including hotels, motels, stores, restaurants, and other commercial establishments.

Interburden: A term applied to rock strata between two coal seams to be mined, similar to overburden, which is rock strata overlying a coal seam to be mined. Both interburden and overburden are often referred to collectively as overburden.

Invasive: Those species that colonize natural or semi-natural ecosystems, are agents of change, and threats to native biodiversity. The words exotic, invasive, and non-indigenous are often used synonymously.

Lentic: Non-flowing aquatic systems such as ponds.

Loose Cubic Yards: The volume of overburden material after it has been excavated.

Longwall Mining: Underground mining method whereby wide panels of coal are mined, with mechanical shields used for roof support.

Lotic: Flowing aquatic systems such as streams.

Material Damage: In the context of Secs. 784.20 and 817.121, means: (a) Any functional impairment of surface lands, features, structures or facilities; (b) Any physical change that has a significant adverse impact on the affected land's capability to support any current or reasonably foreseeable uses or causes significant loss in production or income; or (c) Any significant change in the condition, appearance or utility of any structure or facility from its pre-subsidence condition.

Median: The median is the middle of a distribution: half the scores are above the median and half are below the median. The median is less sensitive to extreme scores than the mean and this makes it a better measure than the mean for highly skewed distributions. For example, the median income is usually more informative than the mean income.

Metallurgical: Bituminous coal used in a beehive coke oven.

Mine Mouth: The entrance to a mine, or the point of shipping of raw coal from a surface or deep mine operation.

Mineral Extraction Area: Portion of a mine permit where coal will actually be extracted.

Mitigation: Mitigation includes: (a) Avoiding the impacts altogether by not taking a certain action or parts of an action. (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environments. (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (e) Compensating for the impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Mountaintop Mining/Valley Fill (MTM/VF) Mining: Surface coal mining in the Appalachian coalfield states of Kentucky, Tennessee, Virginia, and West Virginia is conducted by a variety of mining methods and in different topographic settings. Surface coal mining occurring on mountaintops, ridges, and other steep slopes (by definition those of 20 degrees or more) is often referred to as mountaintop mining. Removal of overburden from coal on mountaintop mining sites may result in generation of excess mine spoil in quantities that may not allow regrading of a mine site to its approximate original topographic contours or that must otherwise be disposed of to allow for regrading of a mine site to its approximate original topographic contours or that must otherwise be disposed of to allow for efficient and economical coal extraction. One method of disposing of this excess spoil is to place it the heads of hollows or valleys of streams, a practice often referred to as valley fill. For the purposes of this EIS, steep slope surface coal mining operations that produce excess spoil and dispose of it in heads of hollows or valleys of streams shall be referred to collectively as mountaintop mining/valley fill (MTM/VF) operations, in recognition that repetitive discussion of individual mining methods would be cumbersome.

Mountaintop-Removal Operation: According to SMCRA, a type of surface-mining operation that extracts an entire coal seam or seams running through the upper fraction of a mountain, ridge, or hill. Coal extraction must be accomplished by removing all of the overburden and creating a level plateau or a gently rolling contour that both has no highwalls remaining and is capable of supporting certain postmining land uses.

Multiple Seam Mining: Surface mining in areas where several seams are recovered from the same hillside.

National Pollutant Discharge Elimination System (NPDES): The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 40 of the CWA. [EPA-40 CFR 122.2]

Nationwide Permits: Nationwide permits are a type of general permit and represent DA authorizations that have been issued by the regulation (33 CFR Part 330) for certain specified activities nationwide. If certain conditions are met, the specified activities can take place without the need for an individual or regional permit. [33 CFR 325.5(c) (2)]

NEPA, The National Environmental Policy Act of 1969: Declares the national policy to encourage a productive and enjoyable harmony between man and his environment. Section 102 of that Act directs that "to the fullest extent possible: (1) The policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the federal government shall insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations ". (See Appendix B of 33 CFR Part 325.) (42 U.S.C. 4321-4347)

Neutralization Potential: A measure of the ability of a material to neutralize acidity, expressed in terms of calcium carbonate equivalents. In overburden analysis, this is usually expressed as tons of calcium carbonate equivalent per 1,000 tons of overburden.

NPK Fertilizer: Nitrogen (N), phosphorus (P), and potassium (K) fertilizer with numeric values of the three nutrients expressed as percentage by weight.

Ordinary High Water Mark: That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. [COE-33 CFR 328.3(e)]

Outcrop: (a) The part of a rock formation that appears at the surface of the ground. (b) A term used in connection with a vein or lode as an essential part of the definition of apex. It does not necessarily imply the visible presentation of the mineral on the surface of the earth, but includes those deposits that are so near to the surface as to be found easily by digging. (c) The part of a geologic formation or structure that appears at the surface of the earth; also, bedrock that is

covered only by surficial deposits such as alluvium. (d) To appear exposed and visible at the earth's surface; to crop out.

Outslope: The face of the spoil or embankment sloping downward from the highest elevation to the toe.

Overburden: Designates material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials, ores, or coal--esp. those deposits that are mined from the surface by open cuts.

Pan Scraper: A piece of earthmoving equipment with a belly opening that is used to scrape a surface layer of loose material for excavation. The pan scraper then carries the material to a dump point and dumps it through a set of belly doors.

Panel: Primary coal extraction area in an underground mine, usually rectangular in shape. Multiple panels may be present in a single underground mine.

Perennial Plants: Plants that live for more than one growing season.

Perimeter Ditch: Ditch or channel used to convey runoff from within a mining area around the outside perimeter of the mining area to a controlled discharge point, such as a sedimentation pond. When sediment trapping basins are included in the ditch design, a perimeter ditch may also be referred to as a sediment ditch.

Phase: Sequenced operational areas to divide the progression of a surface mine.

PHC, Probable Hydrologic Consequences: The PHC process consists of the following steps, repeated as many times as necessary to mitigate adverse impacts: Data collection; Characterization of the premining hydrologic balance; Prediction of mining disturbances; Design of measures to mitigate mining disturbances; and Documentation of residual impacts to the hydrologic balance remaining after implementation of mitigative measures. The remaining unmitigated impacts must be documented in the PHC determination. This iterative PHC process is intended to reduce the predicted adverse impacts to the hydrologic balance to an acceptable level. A sample outline for the PHC determination is available for downloading at <http://www.osmre.gov//hyphc.htm>.

Pit: In surface mining, the void left after removal of overburden to expose the coal in a cut.

Premining/Postmining Land Use: The primary uses of the land before and after mining. After mining, land is generally required to be returned to its premining use. A site may be returned to an alternative postmining land use if certain requirements are satisfied. Permits involving mountaintop removal or steep-slope mining operations with variances from AOC may be issued by the regulatory authority only if they meet certain specified postmining land use as described in the approved state program. Some examples of postmining land uses include, but are not limited to: combined uses, commercial woodland, fish and wildlife habitat and recreation lands, forestland, residential, rangeland, or pasture.

Preparation Plant: A facility where coal is subjected to chemical or physical processing or cleaning, concentrating, or other processing or preparation. A preparation plant's facilities include, but are not limited to, the following: loading facilities; storage and stockpile facilities; sheds, shops, and other buildings; water-treatment and water-storage facilities; settling basins and impoundments; and coal processing and other waste disposal areas.

Production (Cut) Areas: Main coal producing areas of an MTM/VF mine where mining is conducted using large linear cuts and heavy production equipment.

Production Equipment: Heavy equipment used for primary spoil movement and coal excavation, usually draglines, shovels, hydraulic excavators, or large loaders, the latter three working with haul trucks; also large dozers in the case of cast blasting.

Recovery Rate: The net percentage of the total coal in a reserve that is recovered by mining and not left in the ground. Can be applied either to the total reserve or to working areas within a reserve.

Relief: Difference in elevation between the highest mountaintop, ridge, or hill and the lowest valley within a permit area.

Reserve: That portion of the demonstrated coal reserve base that is estimated to be recoverable at the time of determination. The reserve is derived by applying a recovery factor to that component of the identified coal resource designated as the demonstrated reserve base.

Reserve Evaluation: Process of assessing the extent and value of coal reserves on a prospective mine site.

Revegetation: Plants or growth that replaces original ground cover following land disturbance.

Required Findings: Specific findings that a regulatory authority must make prior to granting a mountaintop-removal or steep-slope AOC variance [Subsections 515(c) and (e) of SMCRA].

Runoff: That portion of the rainfall that is not absorbed by the deep strata, is used by vegetation or lost by evaporation, or that may find its way into streams as surface flow.

Scope: Scope (as defined in 40 CFR 1508.25) consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement. The scope of an individual statement may depend on its relationships to other statements (NEPA §§ 1502.20 and 1508.28). To determine the scope of environmental impact statements, agencies shall consider three types of action, three types of alternatives, and three types of impacts. They include: (a) Actions, other than unconnected single actions, which may be: 1) connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they automatically trigger other actions which may require environmental impact statements, cannot or will not proceed unless other actions are taken previously or simultaneously, or are interdependent parts of a larger action and depend on the larger action for their justification. 2) cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.

3) similar action, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement. (b) Alternatives, which include: 1) No action alternative; 2) Other reasonable courses of actions; 3) Mitigation measures, not in the proposed action. (c) Impacts, which may be: 1) Direct; 2) Indirect; 3) Cumulative.

Secondary Extraction: Removal of residual coal after primary extraction methods have been completed, such as highwall mining in surface mined or pillar recovery in underground mines.

Sediment: Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the Earth's surface either above or below sea level.

Sediment Channel/Ditch: see Perimeter Ditch.

Sedimentation: The process of depositing sediments carried by water.

Sedimentation Pond: A reservoir for the confinement and retention of silt, gravel, rock, or other debris from a sediment-producing area.

Severance Tax: A tax levied against coal as it is mined, based either on the value of the coal or at a flat rate per ton, used to compensate federal, state, and sometimes local governments for the value of the portion of the reserve that is extracted.

Shovel (Electric): (a) Any bucket-equipped machine used for digging and loading earthy or fragmented rock materials. (b) There are two types of shovels, the square-point and the round-point. These are available with either long or short handles. The round-point shovel is used for general digging since its forward edge, curved to a point, most readily penetrates moist clays and sands. The square-point shovel is used for shoveling against hard surfaces or for trimming.

Shrinkage Factor: Percent decrease in loose material volume resulting from backfilling and subsequent compression by overlying material.

Significant: "Significant" as used in NEPA (40 CFR 1508.27), requires consideration of both context and intensity:

- **Context.** This means that the significance of an action must be analyzed in several contexts, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

- **Intensity.** This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:
 1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
 2. The degree to which the proposed action affects public health or safety.
 3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, and wild and scenic rivers, or ecologically critical areas.
 4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
 5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
 6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
 7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
 8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for the listing in the National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historic resources.
 9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
 10. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Slake Durability: The ability of rock or spoil materials to resist dissolution or breakdown in water; used for assessing the suitability of spoil material for use in valley fill construction.

Special Handling: General term for methods of blending, isolation, or encapsulation of toxic materials within the backfill to prevent adverse impacts to chemical water quality.

Spread: Colloquial mining industry term for a working piece of production equipment (shovel, hydraulic excavator, loader, etc.) and its attendant group of haul trucks that carry away spoil as it is excavated.

Spoil: Overburden, non-mineral or other material removed in mining.

Spoil Bank: A term common in surface mining to designate the accumulation of overburden. Also, underground mine refuse piled outside.

Soil Horizons: Means contrasting layers of soil parallel or nearly parallel to the land surface. Soil horizons are differentiated on the basis of field characteristics and laboratory data. The four master soil horizons are : (a) A horizon. The uppermost mineral layer, often called the surface soil. It is the part of the soil in which organic matter is most abundant, and leaching of soluble or suspended particles is typically the greatest; (b) E horizon. The layer commonly near the surface below an A horizon and above a B horizon. An E horizon is most commonly differentiated from an overlying A horizon by lighter color and generally has measurably less organic matter than the A horizon. An E horizon is most commonly differentiated from an underlying B horizon in the same sequum by color or higher value or lower chroma, by coarser texture, or by a combination of these properties; (c) B horizon. The layer that typically is immediately beneath the E horizon and often called the subsoil. This middle layer commonly contains more clay, iron, or aluminum than the A, E, or C horizons; and (d) C horizon. The deepest layer of soil profile. It consists of loose material or weathered rock that is relatively unaffected by biologic activity.

Steep Slope: Any slope of more than 20 degrees or such lesser slope as may be designated by the regulatory authority after consideration of soil, climate, and other characteristics of a region or state [30 CFR § 701.5].

Steep-Slope Mining: Type of surface-mining operation where the natural slope of the land within the proposed permit area exceeds an average of 20 degrees.

Storage Capacity: The amount of water that can be store in a specific volume of rock.

Stratum: Geologic term for a sedimentary rock bed, plural strata.

Stripping Ratio: The unit amount of spoil or overburden that must be removed to gain access to a unit amount of coal. Generally expressed in cubic yards of overburden to raw tons of mineral material.

Sub-Bituminous Coal: Coal of rank intermediate between lignite and bituminous. In the specifications adopted jointly by the American Society for Testing and Materials (D388-38) and the American Standards Association (M20 .1-1938), *subbituminous* coals are those with calorific values in the range 8,300 to 13,000 Btu (19.3 to 30.2 MJ/kg), calculated on a moist, mineral-mater-free basis, which are both weathering and nonagglomerating according to criteria in the classification.

Subsidence: Lowering of the ground surface resulting from collapse of underground mine voids.

Support Areas: Portions of a mine permit that are maintained to support the production and development areas, such as haul roads, building facilities, and erosion and sedimentation control facilities.

Swell: The tendency of soils and bedrock, on being removed from their natural, compacted beds, to increase or swell owing to the creation of voids or spaces between soil or rock particles. The volumetric increase, normally expressed as a percentage, that occurs as the consequence of changing undisturbed overburden (bank) into loose (excavated) material.

Swell Factor: The percentage increase in the volume of rock material as it is broken to form spoil, resulting from the creation of voids between the broken rock fragments that were not present in the original unbroken rock. Also used in industry as the equivalent to the term “bulking factor,” or the net percentage increase between the volume of rock material and its resultant spoil after compaction in backfill.

Syncline: A fold in rocks in which the strata dip inward from both sides towards the axis.

Terrace: A level or nearly level plain, generally narrow in comparison with its length, from which the surface slopes upward on one side and downward on the other side. Terraces and their bounding slopes are formed in a variety of ways, some being aggradational and others degradational.

Topsoil: The A, O, and E soil horizon layers of the four master soil horizons.

Toxic Material: Specific to coal mining, this includes overburden strata or coal materials that have been identified as containing materials that may result in adverse impacts to chemical water quality if exposed to air and water.

Underground Mining: Also known as *deep mining*, a process by which coal is extracted by excavating within the horizon of a coal seam and without removing the overlying overburden for reasons other than primary seam access.

Valley Fill: A fill structure consisting of any material other than coal waste and organic material that is placed in a valley where side slopes of the existing valley measured at the deepest point are greater than 20 degrees, or the average slope of the profile of the valley from the toe of the fill to the top of the fill is greater than 10 degrees.

Waters of the United States:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

VIII. Glossary

- i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial seas;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section.
Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.
8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA. [COE-33 CFR 328.3 (a)]

Wetland: Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. (Section 404 of the Clean Water Act). For resource mapping purposes, the FWS (Cowardin et al. 1979) has also defined wetlands as follows. Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: 1. At least periodically, the land supports predominantly hydrophytes; 2. The substrate is predominantly undrained hydric soils; and 3. The substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Wing Dumping: End dumping of spoil from haul trucks on opposite sides of a valley fill area to create blanket and core drains beneath the fill.